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Marcus Jenkins

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BANK OF AMERICA PLAZA

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EXAMINER

MEYER, JACOB B

ART UNIT

PAPER NUMBER

3618

MAIL DATE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/518,881	Applicant(s) JENKINS, MARCUS	
	Examiner JACOB MEYER	Art Unit 4114	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 39-91 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 59-69, 78-80, 83-85, 88, 90 and 91 is/are allowed.
- 6) ☒ Claim(s) 39-47, 57, 58, 70, 75, 81, 86, 87 and 89 is/are rejected.
- 7) ☒ Claim(s) 48-56, 71-74, 76, 77 and 82 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 December 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>12/20/2004, 08/15/2005</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement filed on 20 December, 2004 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. In particular, a copy of WO 97/23363 dated 07/03/1997 has not been provided. It has been placed in the application file, but the information referred to therein has not been considered.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 39, 40, and 86 are rejected under 35 U.S.C. 102(b) as being anticipated by Wakuta et al (US Pat. No. 5,156,579).

Regarding claim 39, Wakuta et al teaches a hub drive system for a vehicle (Abstract), comprising: a) a tubular housing suspended by the vehicle and having an inboard and an outboard end (Figure 1, Elements 11, 12, lines 6-28 of column 3); b) a wheel hub rotationally mounted on the outboard end of the housing (Figure 1, Element 54); c) an electric motor disposed in the inboard end of housing (Figure 1, Element 20); d) a planetary gearbox, disposed in the outboard end of the housing and driven by the motor through a hollow primary shaft

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(Figure 1, Element 32, lines 24-34 of column 4); e) an output flange of the gearbox operatively connected to the hub (Figure 1, Element 52), f) a casing for the motor (Figure 1, Element 10); g) a stator in the casing (Figure 1, Element 21); h) a hollow rotor rotationally mounted in the casing and operatively connected to the primary shaft of the gearbox (Figure 1, Element 23); i) a gallery defined between the housing and casing and into which a lubricant for the gearbox is injectable to cool the motor (Figure 1, Elements 1-4, lines 12-34 of column 4); j) a passage in the casing to deliver lubricant from said gallery to said hollow rotor to further cool the motor (see lines 12-34 of column 4); and k) said rotor being arranged to deliver said oil to the primary shaft to lubricate the gearbox (see lines 12-34 of column 4).

Regarding claim 40, Wakuta et al discloses a drive system in which the motor casing has a substantially cylindrical outboard end sealed and centered in the housing by an O-ring (Figure 1, Element 39, lines 57-68 of column 3).

Regarding claim 86, Wakuta et al teaches a vehicle incorporating a hub drive system as claimed in claim 39 (Title).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims 41-46, 81, 87, and 89 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wakuta et al (US Pat. No. 5,156,579), further in view of Love et al (US Pat. No. 4,930,590).

Regarding claim 41, Wakuta et al discloses the invention substantially as claimed.

However, Wakuta et al does not teach a drive system in which the casing is a sliding fit in the housing to permit inboard access to the motor without any need for a wheel removal. Love et al discloses a drive system in which the casing is a sliding fit in the housing to permit inboard access to the motor without any need for a wheel removal (Figure 1, lines 50-61 of column 1). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the hub system of Wakuta et al to include the sliding fit permitting easy access of Love et al in order to provide a motor that can be easily serviced which is a common goal in the prior art in the same field of endeavor.

Regarding claim 42, Wakuta et al discloses a hub drive system for a vehicle (Abstract), comprising: a) a tubular housing suspended by the vehicle and having inboard and outboard open ends (Figure 1, Elements 11, 12, lines 6-28 of column 3, wherein the ends are open prior to assembly as in the claimed invention); b) a wheel hub rotationally mounted through hub bearings on the outboard end of the housing (Figure 1, Element 44); c) an electric motor disposed in the

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inboard end of the housing (Figure 1, Element 20); d) a planetary gearbox, disposed in the outboard end of the housing within the radial confines of said bearings and driven by the motor through a primary shaft (Figure 1, Element 32, lines 57-68 of column 3); e) an output flange of the gearbox detachably connected to the hub and closing the outboard end of the housing (Figure 1, Element 52); wherein f) without removing the wheel, the motor is removable inboard of the housing and the gearbox is dismantlable primarily outboard of the housing. It is noted that Wakuta et al does not specifically disclose characteristic (f) described above. However, Love et al discloses a hub drive system wherein without removing the wheel, the motor is removable inboard of the housing and the gearbox is dismantlable primarily outboard of the housing (Figure 1, lines 50-61 of column 1). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the hub system of Wakuta et al to include the sliding fit permitting easy access of Love et al in order to provide a motor that can be easily serviced which is a common goal in the prior art in the same field of endeavor.

Regarding claim 43, Wakuta et al discloses a drive system in which the primary shaft of the gearbox is rotationally supported in the hub (Figure 1, primary shaft mounted in hub to Element 52).

Regarding claim 44, Wakuta et al teaches a drive system in which the other, inboard end of the primary shaft is journalled in the motor (Figure 1, inboard end, Element 34).

Regarding claim 45, Wakuta et al discloses a drive system in which the motor has a casing, a stator fixed in the casing and a rotor rotationally journalled in the casing (Abstract, Figure 1).

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Regarding claim 46, Wakuta et al teaches a drive system in which the primary shaft is journaled in the motor through the rotor (Figure 1, lines 29-56 of column 3).

Regarding claim 81, Wakuta et al discloses a hub drive system for a vehicle (Abstract), comprising: a) a tubular housing suspended by the vehicle and having inboard and outboard open ends (Figure 1, Elements 11, 12, lines 6-28 of column 3, wherein the ends are open prior to assembly as in the claimed invention); b) a wheel hub rotationally mounted through hub bearings on the outboard end of the housing (Figure 1, Element 44); c) an electric motor disposed in the inboard end of housing (Figure 1, Element 20); d) a planetary gearbox, disposed in the outboard end of the housing within the radial confines of said bearings and driven by the motor through a hollow primary shaft (Figure 1, Element 32, lines 57-68 of column 3); e) an output flange of the gearbox operatively connected to the hub and closing the outboard end of the housing (Figure 1, Element 52), f) a casing for the motor (Abstract, Figure 1); g) a stator in the casing (Abstract, Figure 1); h) a hollow rotor rotationally mounted in the casing and operatively connected to the primary shaft of the gearbox (Figure 1, Element 23); i) a gallery defined between the housing and casing and into which a lubricant for the gearbox is injectable to cool the motor (Figure 1, Elements 1-4, lines 12-34 of column 4); j) a passage in the casing to deliver lubricant from said gallery to said hollow rotor to further cool the motor (see lines 12-34 of column 4); and k) said rotor being arranged to deliver said oil to the primary shaft to lubricate the gearbox (see lines 12-34 of column 4); wherein l) without removing the wheel, the motor is removable inboard of the housing and the gearbox is dismantlable primarily outboard of the housing. It is noted that Wakuta et al does not specifically disclose characteristic (l) described above. However, Love et al discloses a hub drive system wherein without removing the wheel, the motor is removable

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inboard of the housing and the gearbox is dismantlable primarily outboard of the housing (Figure 1, lines 50-61 of column 1). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the hub system of Wakuta et al to include the sliding fit permitting easy access of Love et al in order to provide a motor that can be easily serviced which is a common goal in the prior art in the same field of endeavor.

Regarding claim 87, Wakuta et al and Love et al teaches a vehicle incorporating a hub drive system as claimed in claim 39 (lines 6-15 of column 1 of Love et al).

Regarding claim 89, Wakuta et al and Love et al teaches a vehicle incorporating a hub drive system as claimed in claim 81 (lines 6-15 of column 1 of Love et al).

6. Claim 47 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wakuta et al (US Pat. No. 5,156,579), further in view of Love et al (US Pat. No. 4,930,590), and furthermore in view of Monkkonen (US Pat. No. 5,906,249).

Wakuta et al and Love et al disclose the invention substantially as claimed. It is noted that Wakuta et al and Love et al do not specifically teach a drive system in which the gearbox comprises two stages of gear reduction and a gear change mechanism. However, Monkkonen teaches a drive system in which the gearbox comprises two stages of gear reduction and a gear change mechanism (Figure 4, lines 24-40 of column 1 wherein the two stages are the shaft sun gear to the planetary gears and then planetary gears to the ring gear). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the hub drive system of Wakuta et al and Love et al to include the gear change mechanism of Monkkonen in order to allow transmission-like capabilities to within the wheel

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hub of each vehicle wheel therefore minimizing the number of parts required external to the motor for achieving the same goals.

7. Claim 57 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wakuta et al (US Pat. No. 5,156,579), further in view of Hewko et al (US Pat. No. 5,087,229).

Wakuta et al discloses the invention substantially as claimed. It is noted that Wakuta et al does not specifically disclose a drive system in which a brake disc is mounted on the hub and brake callipers are mounted on the housing. However, Hewko et al teaches a drive system in which a brake disc is mounted on the hub and brake callipers are mounted on the housing (Figure 3, lines 18-27 of column 2). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the hub system of Wakuta et al to include the brake disc and caliper system of Hewko et al in order to provide a means of stopping the motor drive and wheel when necessary. Furthermore, the use of the brake disc and caliper is merely an application of known elements to achieve predictable results.

8. Claim 58 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wakuta et al (US Pat. No. 5,156,579), further in view of Love et al (US Pat. No. 4,930,590), and furthermore in view of Hewko et al (US Pat. No. 5,087,229).

Wakuta et al and Love et al disclose the invention substantially as claimed. It is noted that Wakuta et al and Love et al do not specifically disclose a drive system in which a brake disc is mounted on the hub and brake callipers are mounted on the housing. However, Hewko et al teaches a drive system in which a brake disc is mounted on the hub and brake callipers are

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mounted on the housing (Figure 3, lines 18-27 of column 2). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the hub system of Wakuta et al and Love et al to include the brake disc and caliper system of Hewko et al in order to provide a means of stopping the motor drive and wheel when necessary.

Furthermore, the use of the brake disc and caliper is merely an application of known elements to achieve predictable results.

9. Claim 70 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wakuta et al (US Pat. No. 5,156,579), further in view of Hurrell, II (US Pat. No. 5,221,381).

Wakuta et al discloses the invention substantially as claimed. It is noted that Wakuta et al does not specifically disclose a drive system in which an air tube is disposed in the rotor and primary shaft to deliver air from a port in the casing to a port in the hub for controlling tyre pressure of a wheel mounted on the hub. However, Hurrell, II teaches a drive system in which an air tube is disposed in the rotor and primary shaft to deliver air from a port in the casing to a port in the hub for controlling tyre pressure of a wheel mounted on the hub (Figure 1, lines 50-31 of column 2). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the hub system of Wakuta et al to include the tire pressure management system of Hurrell, II in order to monitor and control the tire pressure at each wheel while minimizing the number of parts and space required for such a system thereby reducing cost and weight.

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10. Claim 75 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wakuta et al (US Pat. No. 5,156,579), further in view of Love et al (US Pat. No. 4,930,590), furthermore in view of Hurrell, II (US Pat. No. 5,221,381).

Wakuta et al and Love et al disclose the invention substantially as claimed. It is noted that Wakuta et al and Love et al do not specifically teach a drive system in which an air tube is disposed in the rotor and primary shaft to deliver air from a port in the casing to a port in the hub for controlling tyre pressure of a wheel mounted on the hub. However, Hurrell, II teaches a drive system in which an air tube is disposed in the rotor and primary shaft to deliver air from a port in the casing to a port in the hub for controlling tyre pressure of a wheel mounted on the hub (Figure 1, lines 50-31 of column 2). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the hub system of Wakuta et al and Love et al to include the tire pressure management system of Hurrell, II in order to monitor and control the tire pressure at each wheel while minimizing the number of parts and space required for such a system thereby reducing cost and weight.

Allowable Subject Matter

11. Claims 48-56, 71-74, 76-77, 82 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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12. The following is a statement of reasons for the indication of allowable subject matter:

The prior art when taken alone or in combination with another does not teach or fairly suggest a hub drive motor that comprises a gear change mechanism with a shift ring. Furthermore, the prior art does not teach or fairly suggest a gear change mechanism between the rotor and a first stage gear reduction of the gearbox to provide three options: i) to interpose a further gear reduction stage ahead of said first stage reduction; ii) to disconnect drive of the motor from the gearbox; and iii) to isolate said further gear reduction stage and connect drive from the motor direct to said first stage. With regards to the tire pressure management system of claims 71-74, and 76-77, the prior art does not teach or fairly suggest the system as claimed in the aforementioned claims.

13. Claims 59-69, 78-80, 83-85, 88, 90-91 are allowed.

14. The following is an examiner's statement of reasons for allowance: The prior art when taken alone or in combination with another does not teach or fairly suggest a gear change mechanism between the rotor and a first stage gear reduction of the gearbox to provide three options: i) to interpose a further gear reduction stage ahead of said first stage reduction; ii) to disconnect drive of the motor from the gearbox; and iii) to isolate said further gear reduction stage and connect drive from the motor direct to said first stage.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue

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fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Hokanson (US Pat. No. 6,651,762 B1), Niemann et al (US Pat. No. 6,328,123 B1), Laurent et al (US Pat. No. 6,113,119), Toida et al (US Pat. No. 5,691,584), Hapeman et al (US Pat. No. 3,897,843), Rockwell et al (US Pat. No. 3,812,928), Lee Arthur L et al (US Pat. No. 2,258,328), Forster (US Pat. No. 5,397,281), and Claussen et al (US Pat. No. 6,561,017 B1) disclose wheel hub and tire pressure management systems that may be of interest to Applicant.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JACOB MEYER whose telephone number is (571)270-3535. The examiner can normally be reached on Monday - Friday 9am to 5pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christopher Ellis can be reached on 571-272-6914. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Christopher P Ellis/
Supervisory Patent Examiner, Art Unit
3618

/J. M./
Examiner, Art Unit 4114
02/04/2008